Project Report

Topic : Intelligent Customer Help Desk with Smart Document Understanding.

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1. INTRODUCTION

1.1 Overview

Project Summary:

This project aims at building a "Intelligent Customer HelpDesk with Smart Document Understanding". It is chatbot is quite different from the typical customer care chatbot. The typical customer care chatbot can answer simple questions, such as store locations and hours, directions, and maybe even making appointments. When a question falls outside of the scope of the predetermined question set, the option is typically to tell the customer the question isn't valid or offer to speak to a real person.In this project, there will be another option.This chatbot will take help of Watson Discovery Service which can analyze the data really well and it will help the chatbot to answer the customer's question by showing them the relevant content from the manual. The project shall also use the Smart Document Understanding feature of the Watson Discovery to train the chatbot to identify which questions require the manual as the answer and which don't. It also includes building IBM Cloud Functions to post queries to the Watson Discovery and then building a web application combining this and deploying it on IBM Cloud Platform.

In simpler words, we make a basic chatbot using IBM Watson Assisstant and then using Watson Discovery we train the bot with the manual so that it can answer a harder query and then integrate and deploy the app using IBM Cloud functions and node red.

Project Requirements:

The Project will require some knowledge of python. It will also require the knowledge of working with IBM Cloud features and deployment knowledge.

Functional Requirements :

The functional requirements describe ways a product must behave. It will include :
1. The Customer Help Desk must be able to answer all the questions.
2. It should use the manual wherever possible and avoid connecting to a customer service member.

Technical Requirements :

The technical requirements of this project would be:
1. A Github account
2. An IBM Cloud Account
3. Python Programming
4. Node JS

Software Requirements:

The software requirements include: Watson Assistant, Watson Discovery, IBM Cloud Functions, Node-Red.

Project Deliverables:

The project should deliver a Intelligent Chatbot with Smart Document Understanding which can answer most of the queries asked by the user.
Project Team: K Shivani Sai
Project Duration: 30 days

1.2 Purpose

In a normal Customer Care chatbot, it can answer simple questions like the location and hours of the store, greetings to the customer and also make an appointment if possible. Any other question or query which is a little difficult, it connects the user to an agent which in turn wastes the time of the customer.

So the purpose of this project is to solve this problem. In this project we use an extra feature of Watson Discovery i.e., Smart Document Understanding (SDU). With the help of this feature we train our assistant with the user manual of the particular product and when the customer asks a query related to the product, the chatbot uses the Watson Discovery service to search for the answer in the document and gives a relevant answer instead of connecting the user to an agent. This saves the time of the customer.

1.2.1 Scope of Work

- Create a Customer Care dialog skill in Watson Assistant
- Use Smart Document Understanding to build an enhanced Watson Discovery Collection
- Create IBM Cloud functions action to connect the Watson Discovery and Assistant
- Connect the Assistant skill to the webhook created by the Cloud Function Action.
- Build a web application with integration to all the services and deploy the same on IBM Cloud Platform using Node red.

2. LITERATURE SURVEY

2.1 Existing Problem

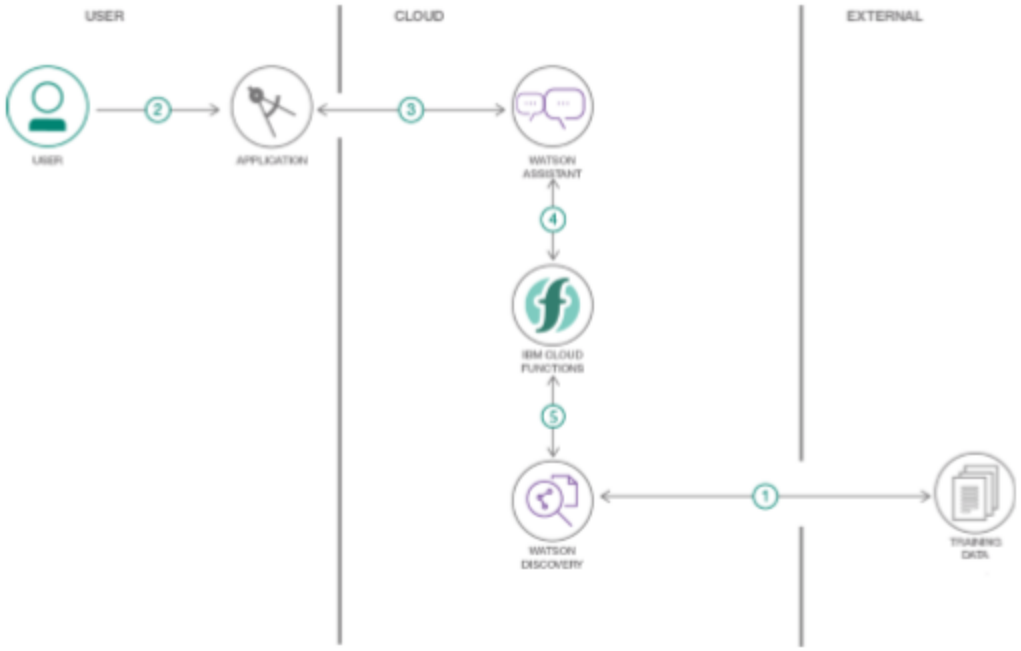
A typical Customer Care chatbot, can answer simple questions like the location and hours of the store, greetings to the customer and also make an appointment if possible. If any question or query falls out of the pre-determined question set, it either states that the question is invalid or connects the user to an agent which in turn wastes the time of the customer.

2.2 Proposed Solution

So the purpose of this project is to solve this problem. In this project there will be another option .We use an extra feature of Watson Discovery i.e., Smart Document Understanding (SDU). With the help of this feature we train our assistant with the pre-loaded user manual of the particular product and when the customer asks a query related to the product, the chatbot uses the Watson Discovery service to search for the answer in the document and gives a relevant answer instead of connecting the user to an agent. So unless and until the customer himself asks the assistant to connect to a customer representative the assistant will answer all of the queries.
To take it a step further, this feature also helps Discovery to train to what text in the document is important and what is not. This will improve the answers returned by the assistant. Node red is used to create a UI for the chatbot which can be deployed and so can be used anywhere.

3. THEORETICAL ANALYSIS

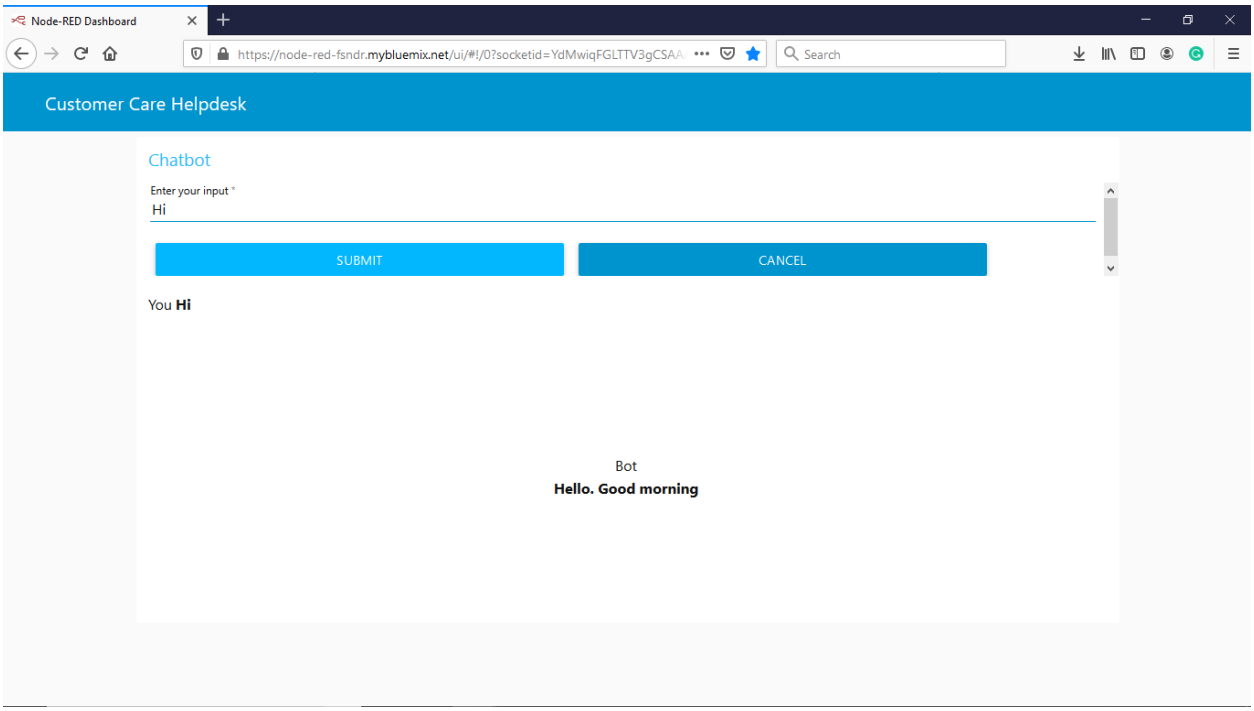
3.1 Block/Flow Diagram

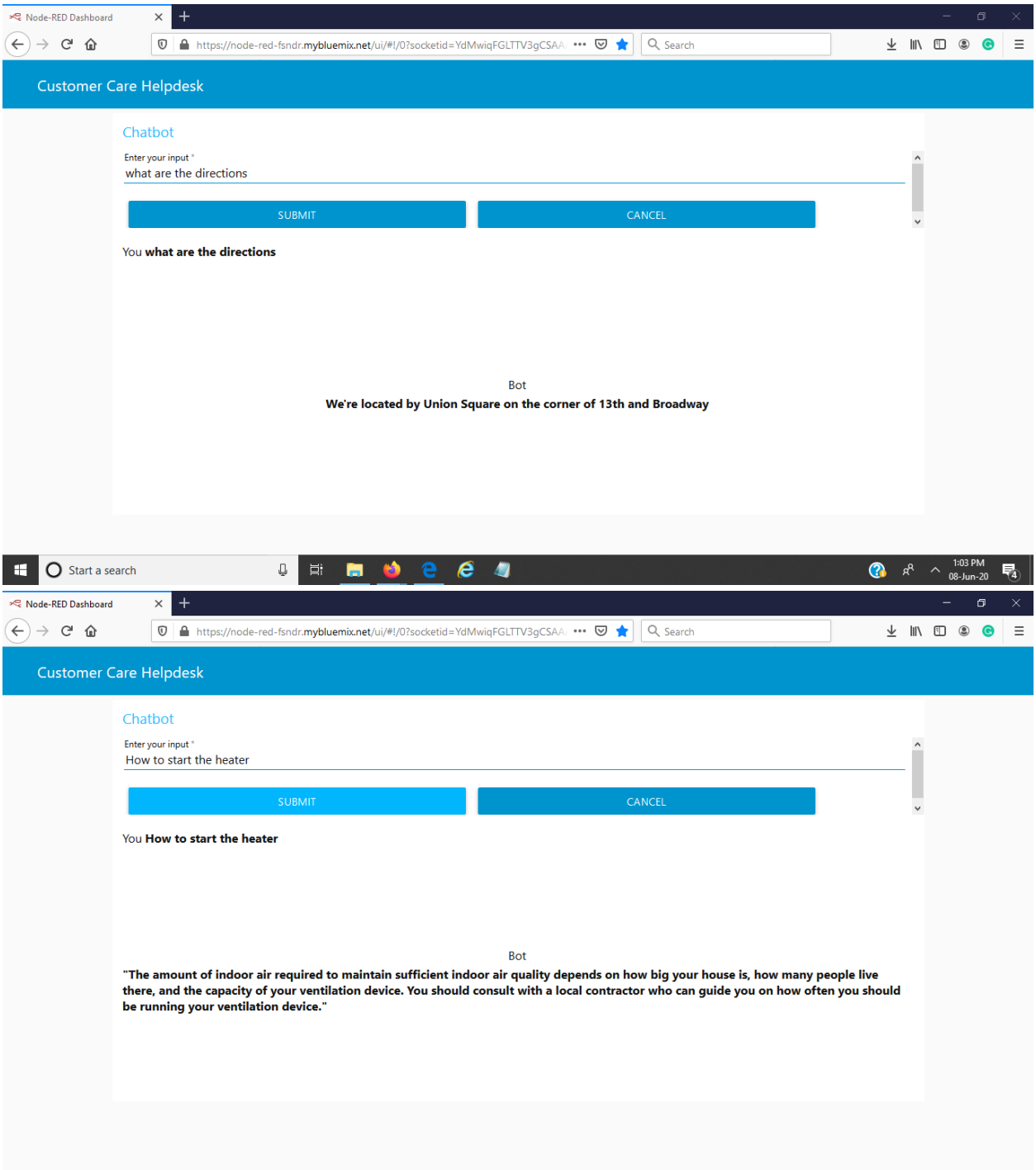


3.2 Hardware/Software Designing

1. Create the necessary Watson Services
2. Configure Watson Discovery
3. Create Watson Cloud Functions Action
4. Configure Watson Assistant
5. Integrate Watson Assistant with Watson Discovery using Webhook.
6. Build Node-RED flow to integrate Watson Assistant with the Web Dashboard.

4. EXPERIMENTAL INVESTIGATION

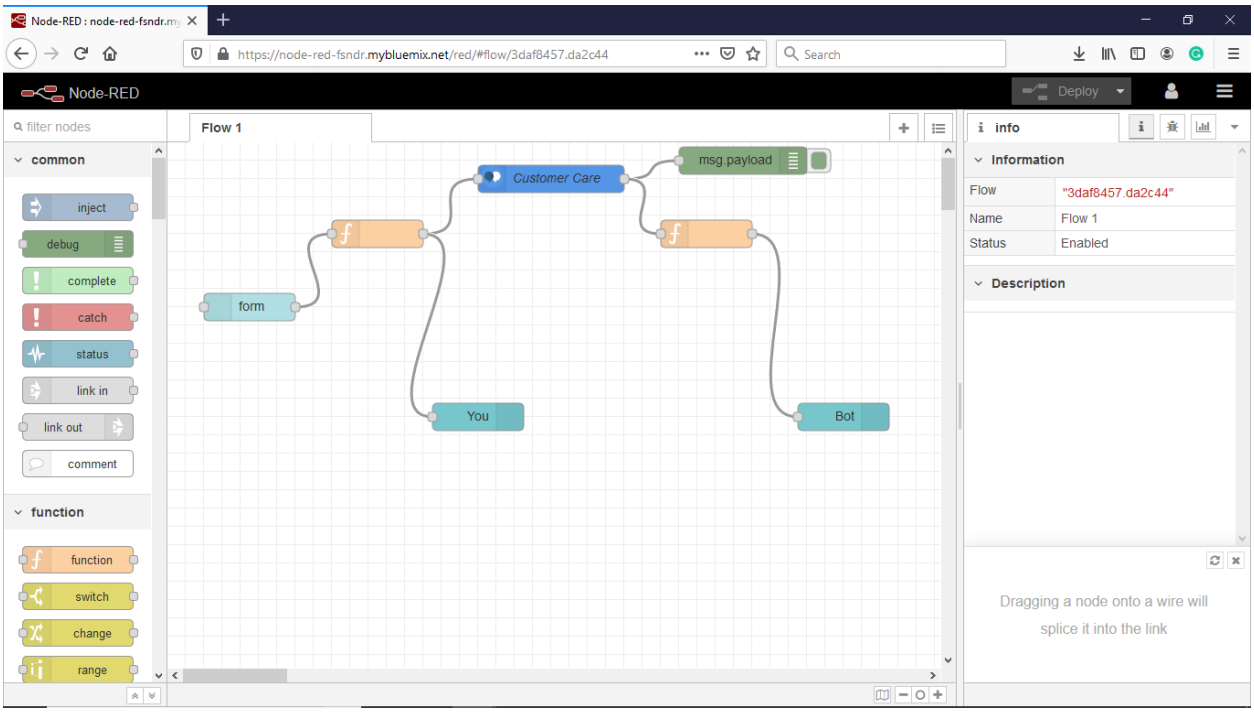



Node-RED Dashboard
https://node-red-fsndr.mybluemix.net/ui/#!/0?socketid=YdMwiqFGLTTV3gCSAA
Search
Customer Care Helpdesk
Chatbot
Enter your input *
what are the directions
SUBMIT
CANCEL
You what are the directions
Bot
We're located by Union Square on the corner of 13th and Broadway
Start a search
1:03 PM
08-Jun-20
Node-RED Dashboard
https://node-red-fsndr.mybluemix.net/ui/#!/0?socketid=YdMwiqFGLTTV3gCSAA
Search
Customer Care Helpdesk
Chatbot
Enter your input *
How to start the heater
SUBMIT
CANCEL
You How to start the heater
Bot
"The amount of indoor air required to maintain sufficient indoor air quality depends on how big your house is, how many people live there, and the capacity of your ventilation device. You should consult with a local contractor who can guide you on how often you should be running your ventilation device."

5. FLOWCHART

I have inserted the following nodes in my Node – RED Flow Editor:

- Form Node
- Function Nodes
- Debug Node
- Assistant Node



6. RESULTS

Web based User-Interface is created by integrating all the services and can be opened using this Url:

https://node-red-fsndr.mybluemix.net/ui/#!/0?socketid=YdMwiqFGLTTV3gCSAAAA

7.ADVANTAGES & DISADVANTAGES

Advantages:-

- It is really cost efficient.
- It reduces manpower
- It can be embedded and used in any other website we build.
- Very less calls will be redirected to the agent which saves time of both the customer and the agent.

Disadvantages:-

- The bot can give irrelevant answers sometimes from the manual.
- It can mislead the user
- It might not understand very few but some of the queries of the user

8. APPLICATIONS

1. This chatbot can be deployed to various Commercial as well as Social Media websites and would be quite useful to the users.
2. Product specific chatbot can also be built by training Discovery with its manual and used for that particular website as Customer Helpdesk.

9. CONCLUSION

In this manner, one can build an Intelligent Customer Helpdesk Chatbot using the IBM Cloud Services namely IBM Watson Assistant, IBM Watson Discovery, IBM Cloud Functions Action and Node-RED.

10. FUTURE SCOPE

We can integrate various other features like Text-to-Speech and Speech-to-Text in the chatbot so that it can be used as Smart Personal Assistant by users.

11. BIBLIOGRAPHY

- Node-RED Starter Application:- https://developer.ibm.com/tutorials/how-tocreate-a-node-red-starter-application/
- Watson Assistant Guide:- https://www.ibm.com/cloud/watson-assistant/ https://developer.ibm.com/components/watson-assistant/series/learningpath-watson-assistant
- Watson Discovery Guide:- https://developer.ibm.com/articles/introductionwatson-discovery/
- Watson Assistant with Webhooks:- https://www.youtube.com/embed/5z3i5IsBVnk
- Cloud Functions Action:- https://www.youtube.com/embed/G3bqRndQtQg

12. APPENDIX

Source Code:-

For source code visit:- https://github.com/SmartPracticeschool/llSPS-INT-1763-Intelligent-Customer-Help-Desk-with-Smart-Document-Understanding